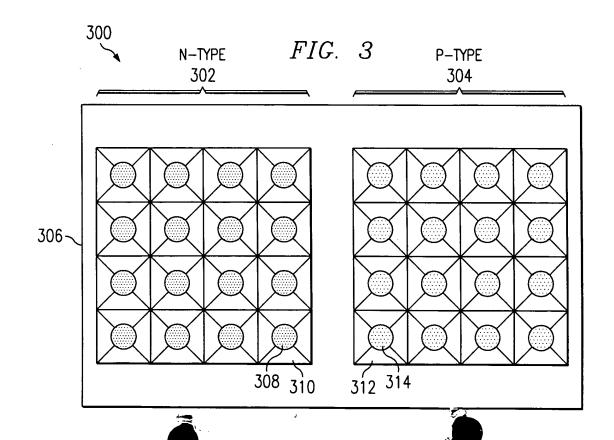
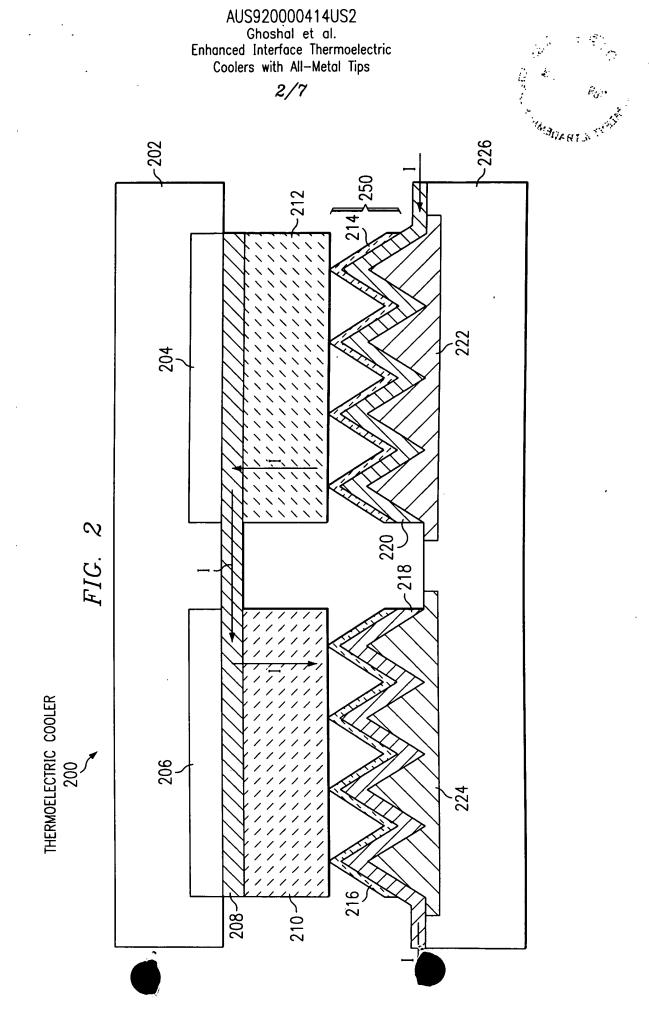
AUS920000414US2 Ghoshal et al. Enhanced Interface Thermoelectric Coolers with All-Metal Tips 1/7 100 <u>112</u> **HEAT SOURCE** -108 FIG. 1 110 (PRIOR ART) **~104** 106-114 114 108 **HEAT SINK** <u>116</u> 102



POWER SOURCE



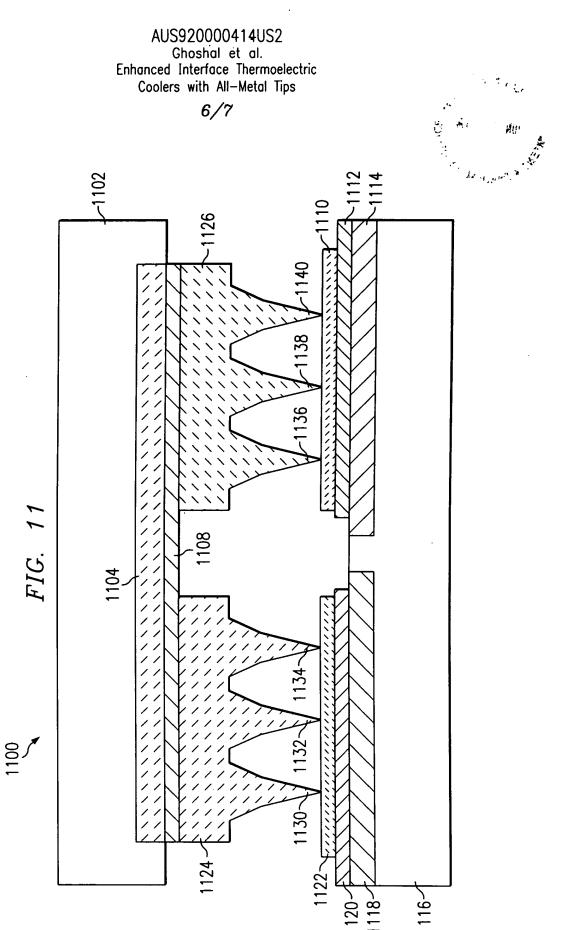
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AUS920000414US2 Ghoshal et al. Enhanced Interface Thermoelectric Coolers with All-Metal Tips 5/7 FIG. 8 FIG. 9 **BEGIN** 906 904 802~ FABRICATE SILICON TIPS BY ANISOTROPIC ETCHING OF Si COAT THE SACRIFICIAL TEMPLATE 804-WITH A THIN SPUTTERED LAYER OF SEED METAL 902 806~ ELECTROCHEMICALLY DEPOSIT COPPER TO FILL THE VALLEYS FIG. 12 PLANARIZE THE TOP SURFACE 808 **BEGIN** REMOVE THE SILICON SUBSTRATE BOND OPTIMIZED SINGLE BY SELECTIVE ETCHING METHODS -1202 810-CRYSTAL MATERIALS TO METAL ELECTRODES END PATTERN OTHER SIDE OF -1204 THERMOELECTRIC MATERIAL FIG.10 USING PHOTORESIST **BEGIN** ELECTROCHEMICALLY ETCH -1206 THE SURFACE PATTERN SMALL SECTIONS OF 1002~ PHOTORESIST ON PATTERNED COPPER LINKS OF THE THIN THIN A SECOND SINGLE FILM TE COOLERS CRYSTAL SUBSTRATE USING CHEMICAL-MECHANICAL **~1208 POLISHING** 1004~ DIRECTLY ETCH THE COPPER **ELECTROCHEMICALLY** ELECTROCHEMICALLY ETCH THE ENTIRE SECOND SINGLE COAT THE COPPER TIPS CRYSTAL SUBSTRATE TO **-1210** WITH NICKEL 1006-NANOMETER FILMS COAT THE NICKEL WITH AN CLAMP THE TWO ULTRA-THIN LAYER OF 1008-SUBSTRATES TOGETHER THERMOELECTRIC MATERIAL -1212

END

END



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